Section II. (REMARKS)

The pending claims in the application are 1-8 and 28-31.

Request for Rejoinder Reminder

Applicants respectfully request rejoinder of method claims 12-19 and 20-27 upon allowance of the composition claims 1-8 and 28-31. Towards that end, withdrawn method claims 12-14, 17 and 19 have been amended in a manner consistent with the pending composition claims.

Amendment to claims 1, 4, 6 and 7 and New claims 28-31

Claim 1 has been amended to include the limitations of original claim 6.

Support for the amendment to claim 4 can be found in the instant specification at paragraph [0023].

Support for the amendment to claims 6 and 7 can be found, inherently and expressly, in the instant specification at paragraph [0021], respectively.

Support for new claim 28 can be found in the instant specification inherently at paragraphs [0021] and [0035]-[0037].

Support for new claim 30 can be found in the instant specification at paragraph [0028].

Support for new claim 31 can be found in the instant specification at paragraph [0004].

No new matter has been added herein.

Rejection of Claims and Traversal Thereof

In the November 29, 2006 Office Action:

claims 1-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Hoy et al. (U.S. Patent No. 5,306,350);

claims 1-6 and 8-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Mullee et al. (U.S. Patent No. 6,277,753);

claims 1-6 and 8-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Koch (U.S. Patent No. 6,331,487);

claims 1-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Cotte et al. (U.S. Patent No. 6,398,875);

claims 1-3, 6-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Biberger et al. (U.S. Patent No. 6,890,853);

claims 1-6 and 8-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Mullee et al. (U.S. Patent No. 6,500,605);

claims 1-3, 6-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Cotte et al. (U.S. Patent Application Publication No. 20020088477); and

claims 1-3, 6-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Cotte et al. (U.S. Patent No. 6,425,956).

These rejections are traversed and reconsideration of the patentability of the pending claims is requested in light of the following remarks.

Rejections under 35 U.S.C. §102

1. In the November 29, 2006 Office Action, claims 1-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Hoy et al. (U.S. Patent No. 5,306,350) (hereinafter Hoy). Applicants traverse such rejection.

Hoy relates to methods for purging, flushing and cleaning a spray apparatus when changing from one material to another material to be sprayed, such as changing color or composition, or when spraying is finished or the apparatus is shut down or idled. More specifically, Hoy relates to a method of removing at least one polymeric compound from said spray apparatus.

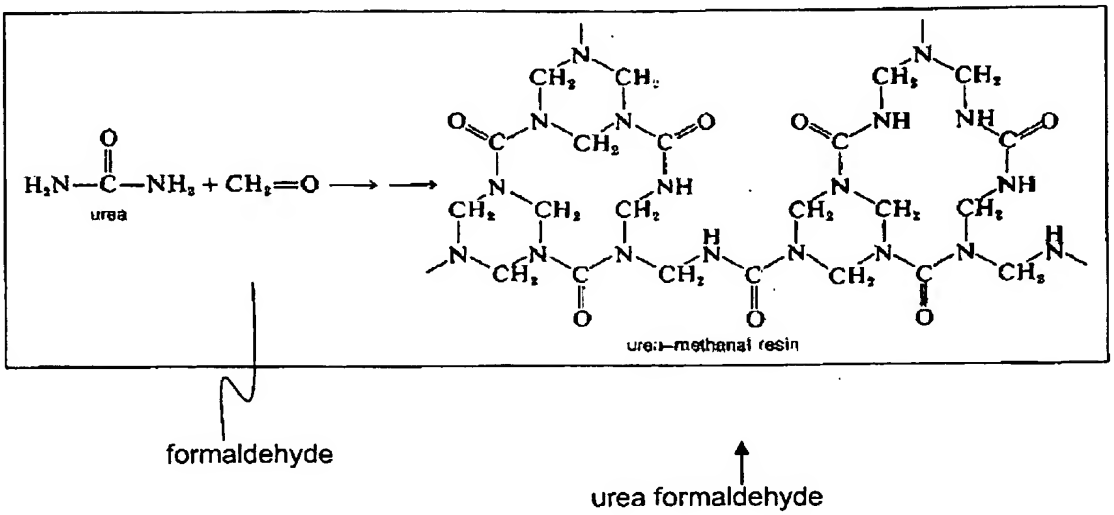
Applicants' claim 1 recites:

> **"A SCF-based removal composition, comprising at least one co-solvent, and at least one reducing agent, wherein the at least one reducing agent comprises at least one of hydrogen gas, formaldehyde, formalin, boranes, diboranes, amine stabilized boranes, amine stabilized alanes, and tetraalkyl amines of BH_4 and AlH_4."**

According to the Examiner, Hoy teaches the following:

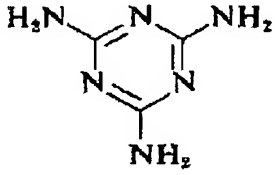
> "Generally, the polymeric components which the cleaning mixture of the present invention will be able to dissolve and/or suspend so as to remove them from an apparatus include vinyl, acrylic, styrenic, and interpolymers of the base vinyl, acrylic, and styrenic monomers; polyesters, oil-free alkyds, alkyds, and the like; polyurethanes, two-package polyurethane, oil-modified polyurethanes and thermoplastic urethanes systems; epoxy systems; phenolic systems; cellulosic esters such as acetate butyrate, acetate propionate, and nitrocellulose; amino resins such as urea **formaldehyde**, melamine **formaldehyde** . . . ." (emphasis in the November 29, 2006 Office Action)

Applicants admit that Hoy discloses urea formaldehyde and melamine formaldehyde resins as polymeric components, however, urea formaldehyde and melamine formaldehyde resins are not synonymous with formaldehyde and are not reducing agents. For example, the synthesis of urea formaldehyde using urea and formaldehyde (also referred to as methanal) is as follows:



It can be seen that *urea formaldehyde* and *formaldehyde* are NOT synonymous with one another.

Melamine, which has the structure shown below, upon reaction with formaldehyde to form melamine formaldehyde, will also NOT result in the formation of a compound which is synonymous with formaldehyde.



2,4,6-triamino-1,3,5-triazine
(melamine)

It is well established, as a matter of law, that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). In the present case, Hoy does not expressly or inherently teach formaldehyde, or any other reducing agent. Accordingly, Hoy does not anticipate applicants' claim 1 and claims depending therefrom.

Withdrawal of the rejection of claims 1-11 as being anticipated by Hoy is respectfully requested.

2. In the November 29, 2006 Office Action, claims 1-6 and 8-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Mullee et al. (U.S. Patent No. 6,277,753) (hereinafter Mullee '753). Applicants traverse such rejection.

Mullee '753 relates to a method of removing chemical mechanical polishing residue from a semiconductor substrate.

According to the Examiner, "hydrogen fluoride and citric acid are well-known reducing agents." Applicants traverse the assertions of the Examiner.

With regards to hydrogen fluoride, there are three conceivable half reactions for HF, as shown below:

$$2H^+ + 2\,e^- \leftrightarrows H_2 \qquad E = 0.00\ V$$

$$F_2 + 2\,e^- \leftrightarrows 2\,F^- \qquad E = 2.87\ V$$

$$\tfrac{1}{2}\,F_2 + H^+ + e^- \leftrightarrows HF \qquad E = 3.03\ V$$

Referring to Appendix A, which is a reproduction of a table of Standard Electrode Potentials,[1] the strongest oxidizing agent (it itself will be reduced in a redox reaction) is F_2 and the strongest reducing agent (it itself is oxidized in a redox reaction) is Li(s). In other words, F^- is probably the worst reducing agent of the species listed in the table of Appendix A. Further, because the standard potential of the half reaction $\tfrac{1}{2}\,F_2 + H^+ + e^- \leftrightarrows HF$ (+3.03 V) is even more positive than that of the half reaction $F_2 + 2\,e^- \leftrightarrows 2\,F^-$ (+2.87 V), HF is an even worse reducing agent than F^-.

Considered *in toto*, applicants do not agree that hydrogen fluoride is a well known reducing agent. The burden hereby shifts to the Examiner to show evidence that HF is a well known reducing agent.

With regards to citric acid, applicants cannot find any evidence that citric acid is a reducing agent. It is noted that although the formic acid is a carboxylic acid and a reducing agent, one

[1] from *General Chemistry*, Darrell D. Ebbing, 5th Edition, Houghton Mifflin Company, Boston, 1996, pg. 799.

cannot make the generalization that all carboxylic acids are reducing agents. The chemical arts are not that predictable. Applicants request that the Examiner provide evidence to support the recitation that citric acid is a well known reducing agent.[2]

Applicants submit that contrary to the Examiner's contentions, HF and citric acid are NOT well known reducing agents and as such, Mullee '753 does not anticipate applicants' claim 1, or claims depending therefrom.

Withdrawal of the rejection of claims 1-6 and 8-11 as being anticipated by Mullee '753 is respectfully requested.

3. In the November 29, 2006 Office Action, claims 1-6 and 8-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Koch (U.S. Patent No. 6,331,487). Applicants traverse said rejection.

Similar to the rejection based on Mullee '753, the rejection based on Koch is predicated on the incorrect assertion that hydrogen fluoride is a well known reducing agent. As already introduced hereinabove, HF is NOT a well known reducing agent. Accordingly, for the same reason, Koch does not anticipate applicants' claim 1 and claims depending therefrom.

Withdrawal of the rejection of claims 1-6 and 8-11 as being anticipated by Koch is respectfully requested.

4. In the November 29, 2006 Office Action, claims 1-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Cotte et al. (U.S. Patent No. 6,398,875) (hereinafter Cotte '875). Applicants traverse said rejection.

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[2] See, 37 CFR 1.104 (d)(2), which recites "[w]hen a rejection in an application is based on facts within the personal knowledge of an employee of the Office, the data shall be as specific as possible, and the reference must be supported, when called for by the applicant, by the affidavit of such employee, and such affidavit shall be subject to contradiction or explanation by the affidavits of the applicant and other persons."

Cotte '875 relates to a process of drying a semiconductor wafer of all trace water using a composition which includes liquid or supercritical CO_2 and a surfactant. The composition may further include a co-solvent such as formic acid.

Comparing applicants' claimed invention with the teaching of Cotte '875, it can be seen that Cotte '875 does not teach each and every limitation of claim 1. Specifically, Cotte '875 does not teach, expressly or inherently, applicants' enumerated reducing agents. Accordingly, Cotte '875 does not anticipate applicants' claim 1 or claims depending therefrom.

New claim 28 recites:

> **"A SCF-based removal composition comprising at least one co-solvent, at least one reducing agent, and ion-implanted photoresist residue material."**

Comparing new claim 28 with Cotte '875, it can be seen that Cotte '875 does not teach or suggest the use of the Cotte '875 composition for the removal of photoresist, much less ion-implanted photoresist. Accordingly, the Cotte '875 composition can never include ion-implanted photoresist residue material and as such, Cotte '875 does not anticipate applicants' claim 28 or claim 29 depending therefrom.

New claim 30 recites:

> **"A SCF-based removal composition consisting essentially of at least one SCF, at least one solvent and formic acid."**

Comparing applicants' claim 30 with Cotte '875, it can be seen that Cotte '875 does not teach a composition consisting essentially of[3] at least one SCF, at least one solvent and formic acid. Instead, a surfactant is a required component in the Cotte '875 composition. Accordingly, Cotte '875 does not anticipate applicants' claim 30.

[3] the transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original).

Withdrawal of the rejection of claims 1-11 as being anticipated by Cotte '875 is respectfully requested.

5. In the November 29, 2006 Office Action, claims 1-3, 6-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Biberger et al. (U.S. Patent No. 6,890,853) (hereinafter Biberger). Applicants traverse said rejection.

Biberger relates to a method of depositing a metal film on a substrate including a supercritical preclean step, a supercritical desorb step, and a metal deposition step. The Biberger method may further include a supercritical residue removal step prior to the supercritical preclean step. A schematic of said method is shown below.

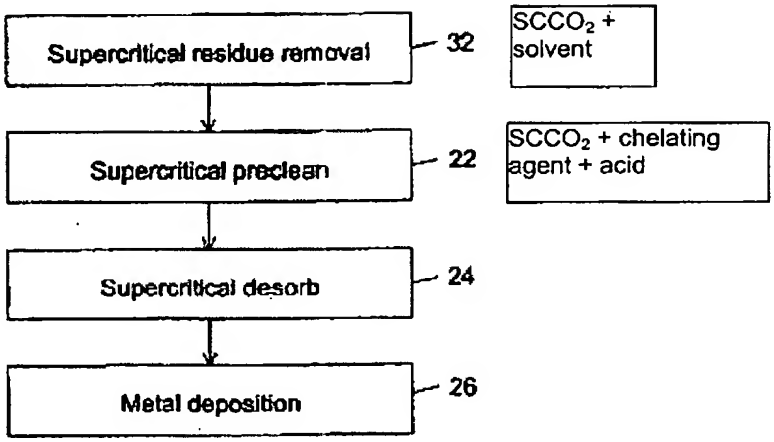

FIG. 2

The composition used in the supercritical preclean step (22) of Biberger may include supercritical CO_2, a chelating agent, and preferably an acid, including formic acid. The composition used in the supercritical residue removal step (32) of Biberger includes supercritical CO_2 and a solvent. There is no teaching, express or otherwise, that the supercritical residue

removal composition of step 32 may include an acid such as formic acid, OR that the supercritical preclean composition of step 22 may include a solvent.

It is well established in the law that to be anticipatory, the elements in the prior art reference must be arranged as required by the claim. See, *In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). Clearly, a reference which teaches some of applicants' claim limitations in one composition and others in a second, different composition does not satisfy the standard of anticipation recited by the *Bond* court. Accordingly, Biberger does not anticipate applicants' claim 1 or claims depending therefrom.

Withdrawal of the rejection of claims 1-3, 6-9 and 11 as being anticipated by Biberger is respectfully requested.

6. In the November 29, 2006 Office Action, claims 1-6 and 8-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Mullee et al. (U.S. Patent No. 6,500,605) (hereinafter Mullee '605).

Mullee '605 relates to a method of removing photoresist and residue from a substrate using a composition including supercritical CO_2, an amine, and a solvent.

According to the Examiner, Mullee '605 teaches that the solvent may be acetic acid, which is a well known acetic acid. Applicants traverse the Examiner's assertion.

Similar to citric acid, applicants cannot find any evidence that acetic acid is a reducing agent. Again, one cannot make the generalization that all carboxylic acids are reducing agents. The chemical arts are not that predictable. Applicants request that the Examiner provide evidence to support the recitation that acetic acid is a well known reducing agent.

Further, Mullee '605 fails to teach any of the reducing agent enumerated in applicants' claim 1. Accordingly, Mullee '605 does not anticipate applicants' claim 1 or claims depending therefrom.

Withdrawal of the rejection of claims 1-6 and 8-11 as being anticipated by Mullee '605 is respectfully requested.

7. In the November 29, 2006 Office Action, claims 1-3, 6-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Cotte et al. (U.S. Patent Application Publication No. 20020088477) (hereinafter Cotte '477) and claims 1-3, 6-9 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Cotte et al. (U.S. Patent No. 6,425,956) (hereinafter Cotte '956). Applicants traverse said rejection.

It is initially noted that Cotte '477 and Cotte '956 correspond to the exact same application (U.S. Patent Application Serial No. 09/755,267). Accordingly, the response will be set forth with regards to Cotte '956.

Cotte '956 relates to a method of removing residual CMP slurry from a workpiece using a composition including supercritical CO_2, a co-solvent, and a surfactant. One of the possible co-solvents disclosed in Cotte '956 is formic acid.

Comparing applicants' claimed invention with the teaching of Cotte '956, it can be seen that Cotte '956 does not teach each and every limitation of claim 1. Specifically, Cotte '956 does not teach, expressly or inherently, applicants' enumerated reducing agents. Accordingly, Cotte '956 does not anticipate applicants' claim 1 or claims depending therefrom.

Comparing new claim 28 with Cotte '956, it can be seen that Cotte '956 does not teach or suggest the use of the Cotte '956 composition for the removal of photoresist, much less ion-implanted photoresist. Accordingly, the Cotte '956 composition can never include ion-implanted photoresist residue material and as such, Cotte '956 does not anticipate applicants' claim 28 or claim 29 depending therefrom.

Comparing applicants' claim 30 with Cotte '956, it can be seen that Cotte '956 does not teach a composition consisting essentially of at least one SCF, at least one solvent and formic acid. Instead, a surfactant is a required component in the Cotte '956 composition. Accordingly, Cotte '956 does not anticipate applicants' claim 30.

Withdrawal of the rejection of claims 1-3, 6-9 and 11 as being anticipated by Cotte '956 is respectfully requested.

Fees Payable

Four (4) claims have been cancelled and four (4) claims have been added herein, thus no fees are due for the number of newly added claims. That said, two (2) of the new claims are independent. As such, a fee of (2 × $200.00) = $400.00 is due.

The fee of $400.00 authorized is to be withdrawn from Deposit Account No. 13-4365 of Moore & Van Allen PLLC.

Conclusion

Based on the foregoing, claims 1-8 and 28-31 are in form and condition for examination. If any additional issues remain, the Examiner is requested to contact the undersigned attorney at (919) 286.8090 to discuss same.

Respectfully submitted

Date: Feb. 28, 2007

By: _____

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